Dart Aerospace Ltd.

Date: Tuesday, 7/17/2007 2:00:47 PM
User: Kim Johnston

Process Sheet

Customer	: CU-DAR001 Dart Helicopters Services	**Drawing Name**	: SUPPORT ARM
Job Number	: 33593		
Estimate Number	: 11669		
P.O. Number	:	**Part Number**	: D2846
This Issue	: 7/17/2007 **S.O. No.** :	**Drawing Number**	: D2846 REV A
Prsht Rev.	: NC	**Project Number**	: N/A
First Issue	: / / **Type** : MACHINED PARTS	**Drawing Revision**	: A
Previous Run	:	**Material**	:
Written By	:	**Due Date**	: 8/15/2007 **Qty:** ~~12~~ 6 **Um:** Each
Checked & Approved By	: AJ 07.07.17		
Comment	: Est. F 02.02.12 Added Inspection Level 8 and Level 5 S M		

Additional Product

Job Number:

Seq. #:	**Machine Or Operation:**	**Description :**
1.0	D6102005	Billet 1X15.25X48"

Comment: Qty.: 1.0000 Each(s)/Unit Total : 12.0000 Each(s)
Billet 1X15.25X48"
Pick Billet: D6102-005 (15.25" x 48.00" x1.00")
Note: 1 Billet makes 3 parts
Batch No: B33680
M.A 08/03/31

Seq. #:	**Machine Or Operation:**	**Description :**
2.0	HAAS1	HAAS CNC VERTICAL MACHINING #1

Comment: HAAS CNC VERTICAL MACHINING #1
Machine per Folio FA194
Deburr
SD 08/04/01

Seq. #:	**Machine Or Operation:**	**Description :**
3.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE

Comment: INSPECT PARTS AS THEY COME OFF MACHINE SD 08/04/01

Seq. #:	**Machine Or Operation:**	**Description :**
4.0	QC8	SECOND CHECK

Comment: SECOND CHECK SF 08/04/07.

Seq. #:	**Machine Or Operation:**	**Description :**
5.0	SMALL FAB 1	SMALL & MEDIUM FAB RESOURCE 1

Comment: SMALL & MEDIUM FAB RESOURCE 1
Drill holes as per Dwg D2846 and Drill Jig DT8249
FF 08-04-15

PC

See 2nd page →

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Dart Aerospace Ltd

W/O:		**WORK ORDER CHANGES**					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: D 2846 D407-302-011 **PAR #:** ______ **Fault Category:** ________________ **NCR:** Yes No **DQA:** _____ **Date:** _________

QA: N/C Closed: _____ **Date:** _________

NCR: 33593		**WORK ORDER NON-CONFORMANCE (NCR)**						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			
08.04.01	2.0	3 parts → bottom thickness is .141. Should be .125 .006 over tolerance R.C. Raw material too thick ↳ unable to measure part until completed	QSI042	See below ↓	SD 08/04/01	08.04.16	QSI042	08.04.16
08.04.01	2.0	3 parts → machining marks on end of parts R.C. programming error! minor chatter.	QSI042	lightly buff area using a blue pad.	SD 08/04/01	08.04.16	QSI042	08.04.02
08.04.01	1.0	6 parts → material too thick. 1.045 instead of 1.000 Thickness at bottom of pocket = 0.138"	08.04.02 per QSI042	~~Debur~~ Remove ≈ 0.015" WITH DEBURRING MACHINE. THICKNESS NOW ≤1.020. PARTS ACCEPTABLE	SD 08.04.01	08.04.16	08.04.02 per QSI042	08.04.16

NOTE: Date & initial all entries

REF DS EMAIL

H:\fFORMS\Quality Assurance\approved QA\NCRWO RevD

Process Sheet

30min

17/04/2008
S.038 ~~09.27~~
#1 320.5 °F
#2 D2846 °F
#3 B33593 °F
#4 °F

Customer: CU-DAR001 Dart Helicopters Services
Drawing Name: SUPPORT ARM

Job Number: 33593
Part Number: D2846

Job Number:

Seq. #:	Machine Or Operation:	Description :	
6.0	QC5	INSPECT WORK TO CURRENT STEP	
	Comment: INSPECT WORK TO CURRENT STEP		08-04-16
7.0	HAND FINISHING1	HAND FINISHING RESOURCE #1	⑥
	Comment: HAND FINISHING RESOURCE #1 Acid etch and Alodine as per QSI 005 4.1		08-04-17
8.0	POWDER COATING	POWDER COATING M107550	
	Comment: POWDER COATING Powder Coat White Gloss (Ref: 4.3.5.1) as per QSI 005 4.3		FL 08/04/17 ⑥
9.0	QC3	INSPECT POWDER COAT/CHEMICAL CONVERSION	
	Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION		08-04-17 ⑥
10.0	PACKAGING 1	PACKAGING RESOURCE #1	
	Comment: PACKAGING RESOURCE #1 Identify and Stock Location: ST 206		08/04/17 x6
11.0	QC21	FINAL INSPECTION/W/O RELEASE	08/04/18
	Comment: FINAL INSPECTION/W/O RELEASE		

Job Completion

MF 08-04-18

P10 →

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: D2846 **PAR #:** N/A **Fault Category:** Prod/FB. AS med & small **NCR:** Yes [✓] No **DQA:** D **Date:** 08/04/18

QA: N/C Closed: D **Date:** 08/04/21

NCR: 33593

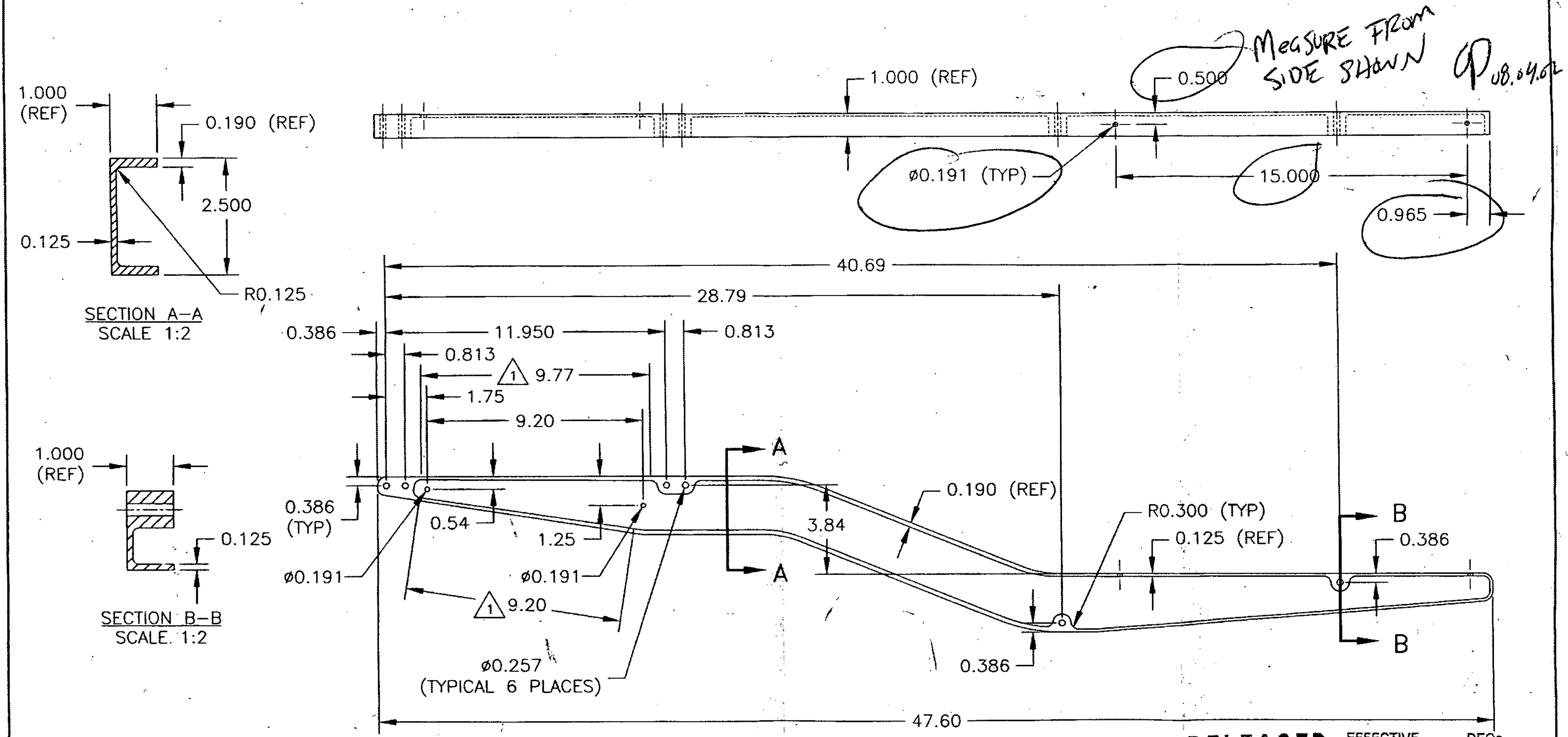
WORK ORDER NON-CONFORMANCE (NCR)

DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			
08-04-16	5.0	Jig DT8249 made a tiny indentation on the part when it was bolted on for drilling. R.C: Shim on the jig was not properly placed, and the bolt tightened into the material. Very small.	QS1442	- fill area with weld per QS1004 - grind flush - debur. Qty 7 part only Rod M106734	08-04-16	08-04-16	QS1442	08-04-16

NOTE: Date & initial all entries

H:\fFORMS\Quality Assurance\approved QA\NCRWO RevD

887



SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 33593

MATERIAL: 6061–T6 (QQ–A–200/8) OR (QQ-A-250/11) OR (QQ-A-225/8) KE 98.12.03 TSR A1031
FINISH: ACID ETCH AND ALODINE PER DART QSI 005 4.1
POWDER COAT WHITE (4.3.5.1) PER DART QSI 005 4.3
TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED

△1 TAPERED WALL THICKNESS FROM 0.190" TO 0.125" OVER INDICATED LENGTH.

RELEASED 98.11.19 KE

EFFECTIVE	DEOs
9126	

QA COPY ISSUED

A	98.11.04	NEW ISSUE	
DESIGN KE	DRAWN BY KE	DART	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA
CHECKED	APPROVED	DRAWING NO. D2846	REV. A SHEET 1 OF 1
DATE 98.11.04		TITLE SUPPORT ARM	SCALE 1:4

-02

DART AEROSPACE LTD		**Work Order:**	33593
Description: Support Arm		**Part Number:**	A 2846
Inspection Dwg:	**Rev:** A		**Page 1 of 1**

FIRST ARTICLE INSPECTION CHECKLIST

☑ **First Article** ☐ **Prototype**

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
1.000 (ref)	±.010					
.190 (ref)	±.010	.189	✓			
2.500	±.010	2.502	✓			
R.125	~~R~~ ±2	R.125	✓			
.125	±.010	.131	✓			
.386	±.010	.381	✓			
.386	±.010	.382	✓			
.813	±.010	.810	✓			
11.950	±.010	11.948	✓			
9.20	±.030	9.20	✓			
0.54	±.030	.5345	✓			
1.25	±.030	1.245	✓			
Ø.191	+.006 -.001	Ø.1915	✓			
Ø.257	+.006 -.001	Ø.258	✓			
.190	±.010	.189	✓			
.125	±.010	.124	✓			
.386	±.010	.383	✓			
~~Ø.191~~	~~+.006 -.001~~					
~~.500~~	~~±.010~~					
~~15.000~~	~~±.010~~					
~~.965~~	~~±.010~~					

General Assembly
N/A

Measured by:	SD	**Audited by:**	S.F.	**Prototype Approval:**	N/A
Date:	08/04/01	**Date:**	08/04/07	**Date:**	

Rev	Date	Change	Revised by	Approved
A		New Issue	KJ/RF	

Chris Provencal

From: David Shepherd [dshepherd@dartaero.com]
Sent: April 4, 2008 4:00 PM
To: 'Chris Provencal'
Subject: RE: NCR D2846

Hi Chris,

I was wondering about that. Thanks for the clarification.
I agree with you that the parts are acceptable.

David

From: Chris Provencal [mailto:cprovencal@dartaero.com]
Sent: Friday, April 04, 2008 9:37 AM
To: 'David Shepherd'
Subject: RE: NCR D2846

David, there's a typo in my email, the thickness of the arms are now <=1.020" (was 1.045").

From: Chris Provencal [mailto:cprovencal@dartaero.com]
Sent: April 2, 2008 2:20 PM
To: 'David Shepherd'
Cc: 'Mike Petsche'
Subject: NCR D2846

David,

The thickness of the raw material was approx 1.045", they normally don't face this material. They didn't pick this up on the first 3 pieces. The thickness at the base of the pocketing is also too thick (everything shifted upwards): should be 0.125", I measured 0.138". Based on bolt length calcs I did, we only had 0.035" of play before the assembly ran out of threads in safety.

I had them shave off material (we used the mechanical deburring machine) to reduce the overall thickness of the part (JL's recommendation). The topmost surface is now very smooth and polished... The thickness of the arms are now all <=0.120". The thickness at the base of the pocketing was unchanged (still over tol).

I think they are now OK.

-Chris